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Developmental Stages and the CEFR Levels in Foreign Language Learners' Speaking and Writing

Yumiko Yamaguchi[1*]

[1] International Education Centre, Tokai University, Japan

[*] Yumiko Yamaguchi, International Education Centre, Tokai University, Japan

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Abstract

This paper aims to investigate foreign language learners' speaking and writing based on a second language acquisition (SLA) theory and the Common European Framework of Reference for Languages (CEFR; Council of Europe, 2001). While the CEFR has been widely used as a reference instrument in foreign language education, there has been insufficient empirical research undertaken on the CEFR levels (e.g., Hulstijin, 2007; Wisniewski, 2017). Also, few studies have examined how the CEFR levels relate to the developmental stages predicted in SLA theories. In this study, spoken and written narratives performed by 60 Japanese learners of English are examined based on one of the major SLA theories, namely Processability Theory (PT; Pienemann, 1998, 2005; Bettoni & Di Biase, 2015), as well as on the CEFR. Results show that the Japanese L1 learners acquire English syntax as predicted in PT in both speaking and writing. In addition, there seems to be a linear correlation between the CEFR levels and PT stages. However, it is also found that the learners at the highest PT stage are not necessarily at a higher CEFR level.

Keywords

CEFR, Processability Theory, Developmental stages, Foreign language learners

1. Introduction

The Common European Framework of Reference for Languages (CEFR; Council of Europe, 2001) provides a comprehensive description about "what language learners have to do in order to use a language for communication and what knowledge and skills they have to develop so as to be able to act effectively" (2001, p. 1). In the CEFR, language learners' communicative proficiency is described at six levels, including A1, A2, B1, B2, C1 and C2. Learners at A1/A2 can be considered as Basic Users, those at B1/B2 can be Independent Users, and those at C1/C2 can be Proficient Users. In current

foreign language education, the CEFR has been one of the most common reference tools used in various ways, such as the syllabus construction, curriculum coordination, and preparation for textbooks and examinations. On the other hand, empirical research on the CEFR has not been sufficiently conducted with data from second language (L2) learners (Hulstijin, 2007). In addition, few studies have examined how the CEFR levels are related to the developmental stages predicted in SLA theories (e.g., Granfeldt & Ågren, 2013; Hagenfeld, 2017).

Processability Theory (PT; Pienemann, 1998; Pienemann, Di Biase, & Kawaguchi, 2005; Bettoni & Di Biase, 2015) is a theory of SLA which assumes the existence of a universal hierarchy in second language (L2) development. PT was originally formulated in 1998 and hypothesizes the developmental stages of grammatical structures, including morphology and syntax, based on Levelt's (1989) Speech Model and Lexical Functional Grammar (LFG; e.g., Bresnan, 2001). In accordance with the development of LFG, the hypotheses focusing on the development of syntax were proposed in the extension of PT (Pienemann, Di Biase, & Kawaguchi, 2005). More recently, these hypotheses have been further developed (Bettoni & Di Biase, 2015) and tested in various second languages (e.g., Bettoni & Di Biase, 2015; Keßler, Lenzing, & Liebner, 2016).

One of the hypotheses in PT extension, the Lexical Mapping Hypothesis, concerns the development of argument mapping between thematic roles and grammatical functions in sentence construction. Table 1 summarizes the developmental stages of English syntax predicted in the Lexical Mapping Hypothesis.

Table 1. Developmental Stages for English Syntax Based on the Lexical Mapping Hypothesis (after Pienemann, Di Biase, & Kawaguchi, 2005)

STAGE	STRUCTURE	EXAMPLE
4. NON-DEFAULT MAPPING	passive	*The ball is kicked by Mike*
	causative	*Liz makes Bob wash the car*
	unaccusative	*The vase broke*
	psych verbs	*The movie scared John*
3. DEFAULT MAPPING + ADDITIONAL ARGUMENT	Ditransitive	*Janet gave Ben a present*
	Canonical sentence + Oblique argument	*Sam placed the vase on the table*
2. DEFAULT MAPPING	Canonical word order	*Mike kicks a ball*
	e.g., agent-event-patient	
1. LEMMA ACCESS	single words	*Here*
	formulas	*My name is Peter*

According to the Lexical Mapping Hypothesis, when L2 learners become able to produce utterances of more than one word, they start constructing sentences using "default mapping". In "default mapping", the highest available role in the thematic hierarchy, namely the Agent, is mapped onto the Subject (SUBJ) grammatical function. The sample sentence (1) shows a typical "default mapping" with a transitive verb "*kick*", which requires two arguments.

(1) *Mike kicks a ball*

In (1), the most prominent role, the Agent "*Mike*" is mapped onto the SUBJ and the less prominent role, the Patient "*the ball*" is mapped onto the Object (OBJ). The idea that beginning L2 learners map the most prominent thematic role onto the SUBJ is shared by many other language theories (e.g., Pinker, 1984; Slobin, 1985).

L2 learners are assumed to gradually learn how to direct the listener's attention to a particular thematic role lower in the hierarchy by promoting it to SUBJ and de-focus the highest role by mapping it onto a grammatical function other than SUBJ or suppress it. This mapping is called "non-default mapping". A typical case is the Passive. In the sentence (2), the Patient "*the ball*" is mapped onto the most prominent grammatical function, SUBJ, while the highest thematic role, the Agent, is suppressed, and appears as Adjunct, "*by Mike"*.. Since higher processing cost can be required for "non-default mapping", learners are predicted to become able to produce it only after "default mapping" is in place.

(2) *The ball is kicked by Mike*

2. Previous Studies

PT stages in L2 acquisition have been tested in much recent research (e.g., Bettoni & Di Biase, 2015; Keßler, Lenzing, & Liebner, 2016). Although PT is originally designed to examine online speech production, some PT studies (Håkansson & Norrby, 2007; Tang & Zhang, 2015; Yamaguchi & Usami, 2017a, 2017b) have addressed the issues of whether L2 learners use grammatical structures differently in written tasks where they can have more time to use declarative knowledge and monitor their own production. Håkansson and Norrby's study (2007) on 20 Swedish L2 learners has demonstrated support for PT developmental stages in both speaking and writing. Yamaguchi and Usami (2017a, 2017b), who examined the acquisition of English L2 morphology, also found that Japanese learners of English tended to be at the same PT stages for speaking and writing. On the other hand, Tang and Zhang (2015) who examined speaking and writing by 6 Chinese learners of English argued that they were likely to perform better in writing than in speaking.

Regarding the Lexical Mapping Hypothesis, empirical research has been done mainly in Japanese L2 contexts (Kawaguchi, 2005, 2007, 2008, 2009a, 2009b, 2011). As for English L2 contexts, the acquisition of the passive construction has been the focus in both longitudinal (Di Biase, Kawaguchi, & Yamaguchi, 2015) and cross-sectional (Keatinge & Keßler, 2009; Wang, 2009) research. More recently, Kawaguchi's (2016) cross-sectional study examined the acquisition of more various syntactic structures, such as causative construction and sentences containing verbs which requires non-default mapping, namely psychological verbs and unaccusative verbs. In her study, 22 Japanese L1/English L2 speakers in Australia sat for the vocabulary size test (e.g., Nation, 2001). Then, 9 participants were selected according to their vocabulary size (i.e., 3 for High, 3 for Middle, and 3 for Low vocabulary size groups) and given a written translation task which attempted to examine their acquisition of argument mapping. According to Kawaguchi (2016), learners in the high vocabulary size group were able to deal with the

range of non-default mapping with unaccusative and psychological verbs as well as passive and causative constructions, while those in low and mid vocabulary size groups tended to have problems with non-default mapping. Those findings show that there is a connection between learners' vocabulary size and the acquisition of English syntax. However, more studies need to be done on a larger number of learners performing various spontaneous language tasks in order to test the validity of the Lexical Mapping Hypothesis in PT.

As for the relationship between the CEFR levels and PT stages, Granfeldt and Ågren (2013) examined written data produced by 38 Swedish speakers learning French as a third language (L3). In their study, the development of morphosyntax in L3 French was analysed based on PT and the communicative proficiency was measured by two CEFR raters. While they found a strong connection between the CEFR rating and the PT analysis, the dispersion at more advanced stages was shown to increase. Hangefeld (2017), who examined the CEFR-based rating of 21 novice and 10 expert raters on 14 original and 8 edited files of the same speech samples, also found a positive correlation between PT stages and the CEFR levels, only at lower levels. However, little is known about the relationship between the CEFR levels and PT stages for L2 syntax. Also, research with empirical data from foreign language learners in more various areas, such as in Asian countries, is needed.

In order to fill the gap remained in SLA research, in particular in PT studies, the current study attempts to address the following research questions.

1. Is L2 syntactic development found in speaking and writing by Japanese L1/English L2 learners consistent with the prediction in the Lexical Mapping Hypothesis in PT?
2. Is there a connection between the PT stages for L2 syntax and the CEFR levels on learners' speaking and writing?

3. Methodology

60 Japanese learners of English, aged 18-30 (M = 19.40), performed English spoken and written narratives using a wordless picture book called "*Frog, where are you?*" (Mayer, 1969). Half of the learners (i.e., 30 learners) were asked to start with spoken narratives and the other half to start with written narratives to minimize the ordering effects. Their speech production was audio-recorded and transcribed, and their writing was recorded with pen and paper by the learners.

As for the data analysis, 60 speaking files and 60 writing files, that is, 120 files, were examined using PT and the CEFR. The acquisition of default mapping and non-default mapping in learners' speaking and writing is examined based on the Lexical Mapping Hypothesis in PT. While most previous studies examined L2 development based on accuracy, PT has applied the emergence criterion. According to PT, "emergence can be understood as the point in time at which certain skills have, in principle, been attained or at which certain operation can, in principle, be carried out" (Pienemann, 1998, p. 138). PT claims that using a grammatical structure at a high level of accuracy, even 80% to 90%, does not guarantee that the learner will be able to continue producing that structure at the same or higher level of accuracy in the

future. Hence, the systematic use of a target structure is regarded as the start of acquisition in PT. In the current study, if a learner was able to produce sentences constructed by non-default mapping (e.g., passive) more than once with lexical variation, as in (3) and (4), he/she was considered to have reached PT stage 4 for English syntax.

(3) *a dog was followed by so many bees*

(4) *a boy was carried by a deer*

Regarding the CEFR rating, 2 trained CEFR raters analyzed spoken and written narratives by 60 Japanese learners of English and determined the proficiency level for each learner's speaking and writing separately.

4. Results and Discussions

4.1 PT Stages

The results of the PT analysis of 60 Japanese learners' argument mapping in spoken and written narratives show that all the learners were able to produce various sentences with default mapping in both speaking and writing. Table 2 summarizes the learners' PT stages found in speaking and writing. In speaking, two learners used only default mapping in speaking, so these learners can be considered to be at stage 2. On the other hand, in writing, all learners produced stage 3 structures, that is, default mapping plus one more argument. In particular, 36 learners in speaking and 42 in writing were able to use non-default mapping systematically. Since all the learners at stage 4 also produced structures belonging to stage 3, the implicational patterns of Japanese learners' acquisition of argument mapping are found in this study. Thus, it can be argued that the results show support to the Lexical Mapping Hypothesis in PT in both speaking and writing, as found in the previous research (Håkansson & Nobby, 2007).

Table 2. PT Stages in Speaking and Writing by 60 Japanese Learners of English

PT stage	**2**	**3**	**4**
Speaking (n = 60)	2 (3.3%)	22 (36.7%)	36 (60%)
Writing (n = 60)	0	18 (30%)	42 (70%)

Table 3 presents the results of the analysis of the comparison of PT stages in speaking and writing by 60 Japanese learners of English. According to the table, 48 learners are found to be at the same PT stage in both speaking and writing. More specifically, 34 learners are found to be at stage 4 and 14 learners are found to be at stage 3 in both tasks. It suggests that 80% of the participants in this study are found to be at the same stage in both speaking and writing. Also, a statistically significant correlation (.664** at the 0.01 level) were shown between their speaking and writing PT stages. Thus, it can be argued that there is a connection between the Japanese learners' PT stages in speaking and those in

writing in terms of the acquisition of English argument mapping.

It should be noted that 10 learners were found to be at a higher stage in writing, while 2 learners are found to be a higher stage in speaking. Although previous research on PT stages in speaking and writing (Tang & Zhang, 2015) has claimed that Chinese learners' written English is better than their oral English, this study found that 3.3% of the participants performed better in speaking than in writing. While Tang and Zhang (2015) examined the acquisition of morphology by a small number of EFL learners, namely 6 Chinese L1/English L2 university students, this study analyzed Japanese EFL learners' acquisition of syntax focusing on argument mapping. Thus, more research is needed to investigate whether the discrepancy is attributed to L1 differences, the targeted grammatical structures, and so on.

Table 3. Comparison of PT Stages for English Speaking and Writing by 60 Japanese Learners

PT stage	**S=W**		**S<W**		**S>W**
Speaking	4	3	3	2	4
Writing	4	3	4	3	3
n = 60	34 (56.7%)	14 (23.3%)	8 (13.3%)	2 (3.3%)	2 (3.3%)
n = 60	48 (80%)		10 (16.7%)		2 (3.3%)

4.2 CEFR Levels

Table 4 summarizes the results of the CEFR rating for L2 proficiency levels on 60 Japanese learners' speaking and writing by two trained raters. According to the table, 48 learners (80%) in speaking and 33 learners (55%) in writing were found to be at the A2 level. In other words, a majority of the participants in this study were rated as Basic Users in both speaking and writing in the CEFR rating.

While 23 learners (38.3%) were found to be at B1 level in writing, only 9 (15%) were shown to be at the same level in speaking. B2 level was the highest CEFR level found in this study and only 3 learners in speaking and 4 learners in writing were rated at that level. However, it can be argued that Japanese learners of English tend to be at a higher CEFR level in writing than in speaking.

Table 4. CEFR Levels for English Speaking and Writing by 60 Japanese Learners

CEFR level	**Speaking** (n = 60)	**Writing** (n = 60)
C2	0	0
C1	0	0
B2	3 (5%)	4 (6.7%)
B1	9 (15%)	23 (38.3%)
A2	48 (80%)	33 (55%)
A1	0	0

4.3 PT Stages vs. CEFR Levels

Table 5 presents the results of the comparison between 60 learners' developmental stages for argument mapping in PT analysis and L2 proficiency levels rated by CEFR raters. According to the table, learners' CEFR levels tend to be higher in writing than in speaking. While 60% of the learners in speaking and 70% in writing are considered to be stage 4 in PT analysis, 80% of the learners in speaking and 55% in writing were rated as A2 level in CEFR rating. This suggests that a majority of the learners at the highest stage for English syntax in PT were rated to be Basic Users of English by the CEFR raters. However, it should be noted that some linear correlations between the CEFR level and the PT stage in both speaking and writing can be observed in Table 5.

Table 5. Comparison between PT Stages and CEFR Levels Found in English Speaking and Writing by 60 Japanese Learners

Speaking (n = 60)				**Writing** (n = 60)			
B2	0	0	3	**B2**	0	1	3
B1	0	2	7	**B1**	0	7	16
A2	2	20	26	**A2**	0	10	23
CEFR / PT	**2**	**3**	**4**	**CEFR / PT**	**2**	**3**	**4**

Table 6 summarizes the results of the comparison between PT analysis and CEFR rating focusing on the learners' English spoken production. 36 learners are regarded to be at stage 4 in PT analysis, but 26 learners are rated as A2 in CEFR rating for overall spoken production. While 36 learners were regarded to be at the highest stage for English syntax in PT analysis, only 10 of them were rated as Independent Users of English (i.e., B1, B2, B2+) in CEFR rating. On the other hand, it can be claimed that there is a linear correlation between PT stages and the CEFR levels in terms of the learners' spoken production.

Table 6. Comparison between PT Stages and CEFR Levels Found in English Spoken Production by 60 Japanese

Speaking (n = 60)			
B2+	0	0	1
B2	0	1	2
B1	0	4	7
A2	2	17	26
CEFR / PT	**2**	**3**	**4**

Table 7 presents the results of the comparison between PT analysis and CEFR rating focusing on the learners' English written production. While 42 learners were found to be at stage 4 in PT analysis, 24 learners (22 for A2, 2 for A1+) were rated as Basic Users in CEFR rating. However, more learners at PT stage 4 were found to be at a higher CEFR level than those at PT stage 3. Although no learners were found to be at stage 2 in PT analysis of the learners' written narratives in this study, it can be argued that there is a linear correlation between PT stages and CEFR levels in terms of the learners' written production as well.

Table 7. Comparison between PT Stages and CEFR Levels Found in English Written Production by 60 Japanese Learners

Writing (n = 60)			
B2	0	3	3
B1	0	6	15
A2	0	8	22
A1+	0	1	2
CEFR / **PT**	**2**	**3**	**4**

Since 2 learners at PT stage 4 were rated to be at CEFR A1+ level, there seems to be a discrepancy between PT analysis and CEFR rating on the learners' writing. In their written narratives, these learners showed enough evidence to meet the acquisition criterion for syntactic structures belonging to PT stage 4, namely sentences constructed by non-default mapping (i.e., passive, unaccusative), as in the samples (11) to (13) by Learner No.36 (L36). However, the same learner still made some mistakes in sentence formation, as in the sample (14) to (16).

(11) L36: *a dog was followed by so many bees*

(12) L36: *a boy was carried by a deer*

(13) L36: *a dog fall down from the window counter*

(14) L36: *a boy was fall down from the window too**

(15) L36: *honey's house was fall by a dog**

(16) L36: *a boy and a dog were fall-ed by deer from top of the mountain to the river**

While PT applies the emergence criterion to determine whether a target grammatical structure is acquired, the CEFR rating seems more sensitive to the accurate production. That might be the reason why learners regarded to be at a higher PT stage were rated as Basic Users in CEFR rating.

Table 8 presents the results of the comparison between PT stages and CEFR levels in terms of grammatical accuracy. Again, it is clearly shown that the CEFR rating is more sensitive to the accuracy since a majority of PT stage 4 learners were rated as Basic Users by CEFR raters. However, there

seems to be linear correlations between PT stages and CEFR levels found in Japanese learners' speaking and writing in English in terms of grammatical accuracy.

Table 8. Comparison between PT Stages and CEFR Levels Found in English Spoken and Written Production Focusing on Grammatical Accuracy

Speaking (n = 60)				**Writing** (n = 60)			
B2	0	0	0	**B2**	0	0	2
B1+	0	1	4	**B1+**	0	3	5
B1	0	2	5	**B1**	0	4	9
A2	2	18	26	**A2**	0	11	26
A1	0	1	1	**A1**	0	0	0
CEFR / PT	**2**	**3**	**4**	**CEFR / PT**	**2**	**3**	**4**

As for vocabulary range, a majority of learners were rated as basic users in CEFR rating in both speaking and writing, as indicated in Table 9. However, in speaking, only learners at stage 3 or 4 were rated as B1 and only stage 4 learners were rated B2. In writing, only stage 4 learners were rated as B2 or C1. Thus, there seems to be some connections between the PT stages and CEFR rating for vocabulary range.

Table 9. Comparison between PT Stages and CEFR Levels Found in English Spoken and Written Production Focusing on Vocabulary Range

Speaking (n = 60)				**Writing** (n = 60)			
C1	0	0	0	**C1**	0	0	2
B2	0	0	3	**B2**	0	0	3
B1	0	5	2	**B1**	0	8	10
A2+	1	8	11	**A2+**	0	5	12
A2	1	9	20	**A2**	0	5	15
A1	0	0	0	**A1**	0	0	0
CEFR / PT	**2**	**3**	**4**	**CEFR / PT**	**2**	**3**	**4**

As shown in Table 10, the results of the comparison between PT stages and CEFR levels for vocabulary control is similar to those for vocabulary range and there also seems to be a linear correlation between the learners' developmental stages and proficiency levels. However, it should be noted that 1 learner at PT stage 4 were rated as C1 in writing, while there was no C1 learners in speaking. Also, more learners

were found to be at higher CEFR levels. This suggests that Japanese learners of English tend to be better at vocabulary control in writing than in speaking.

Table 10. Comparison between PT Stages and CEFR Levels Found in English Spoken and Written Production Focusing on Vocabulary Control

Speaking (n = 60)				**Writing** (n = 60)			
C1	0	0	0	**C1**	0	0	1
B2	0	0	3	**B2**	0	0	3
B1+	0	1	1	**B1+**	0	2	3
B1	0	1	6	**B1**	0	7	11
A2	2	20	25	**A2**	0	9	24
A1	0	0	1	**A1**	0	0	0
CEFR / PT	2	3	4	**CEFR / PT**	2	3	4

The results also showed that one learner who was rated as CEFR A1 level in speaking was considered to have acquired English syntactic structures belonging to the highest PT stage (i.e., stage 4). Since Learner No.41 (L41) produced English sentences constructed by non-default mapping (i.e., passive, unaccusative) more than once with lexical variation in his/her spoken narrative, as in the samples (17) to (19), the learner can be regarded to be at stage 4 in PT analysis whose acquisition criterion relies on the emergence of the systematic use of a target structure. On the other hand, the CEFR rating for vocabulary control should have been more sensitive to the mistakes the learner made, including wrong verb forms and vocabulary, such as *bite-ed** for *bit*, *honey* for *bees*, *claif** for *cliff* in the samples (17) to (19). This may have caused a wide discrepancy between the PT stage for English syntax and the CEFR level for Learner No.41.

(17) L41: *the was bite, bite-d by mouse and the dog swing honeycomb, swing the tree*

(18) L41: *the bird appeared the hole. the boy was dropped on the tree. the dog was attacked by honey*

(19) L41: *the deer and the boy and the dog fall of claif* by deer*

5. Conclusion

The results of the analysis of the spoken and written narratives by 60 Japanese L1/English L2 learners show that they acquire English syntactic structures in both speaking and writing as predicted in the Lexical Mapping Hypothesis in PT. This finding suggests that PT can be applicable to examine L2 learners' grammatical development in writing as well as in speaking. In addition, it seems that there is a linear correlation between the PT stages and the CEFR levels found in the learners' spoken and written performances. However, a majority of the learners at the highest PT stage for English syntax (i.e., stage

4) were rated as Basic Users (i.e., A2) in the CEFR rating. This suggests that learners at a higher PT stage are not necessarily at a higher CEFR level. While PT analysis whose acquisition criterion relies on the emergence of the systematic use of a grammatical structure, CEFR rating seems more sensitive to the accuracy in learners' use of grammar and vocabulary. Since the present study focused on the acquisition of English syntactic structures in PT analysis, more research is needed in order to investigate the relationship between the CEFR levels and the developmental stages predicted in SLA theories for L2 learners' acquisition of additional various grammatical structures.

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